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Partial history of EPA, ATSDR, OH EPA and OH Department of Health involvement in study of airborne manganese (Mn) in Ohio

- 1999 EPA issues final rule (National Emission Standards for Hazardous Air Pollutants for Ferroalloys Production: Ferromanganese and Silicomanganese). Eramet-Marietta (Marietta, OH) is the only US source in the source category.
- R5 ARD responds to citizen complaints/inquiries on Marietta OH air pollution
- EPA-ORD neurotoxicologist contacts EPA R5 staff regarding potential collaboration on health study of airborne Mn in Ohio
- OH EPA deploys air monitors at three East Liverpool OH sites. EPA also conducts air monitoring near the WTI Incinerator but detects airborne Mn consistent with SH Bell emissions.
- 2000 US Senator Mike DeWine (OH) petitions the Agency for Toxic Substances and Disease Registry (ATSDR) to determine if air pollution is affecting the health of Marietta, OH residents
- EPA conducts air monitoring in the vicinity of the Von Roll Waste Technologies Industries waste incinerator, East Liverpool OH
- 2002-2004 ATSDR community meetings discuss additional air monitoring data in Marietta OH. ATSDR and OH EPA fund, site and deploy additional air monitors.
- 2003 EPA R5 enforcement staff conduct air inspection of Eramet-Marietta, who they believe are substantially contributing to airborne Mn measured at a nearby monitor.
- 2004-2005 ARD staff and ORD neurotoxicologist submit Regional Applied Research Effort (RARE) project proposal for health study of airborne Mn in Marietta OH children. The proposal is selected for funding but delayed due to administrative, collaborative, design and personnel issues.
- Marietta OH citizens ask ATSDR for community health study. ATSDR contacts EPA regarding pooling funds and collaborating on combined EPA-ATSDR study.
- Ongoing R5 EPA involvement with Marietta OH citizen concerns regarding airborne Mn
- 2005 EPA Region 5 sends residual risk test ("risk test memo") results to OAQPS. The purpose of the risk test memo is to determine whether the Ferroalloys Production source category can be eliminated from further study under Clean Air Act section 112(f) based on analysis of available information. Risk test memo results do not support elimination, indicating instead that OAQPS conduct further source category analysis.
- 2007 ATSDR deploys three additional air monitors in Marietta OH vicinity
- 2008 Ohio EPA completes East Liverpool Air Quality study that identifies health risk from Mn (34-fold greater than reference value) and chromium
- Ohio EPA Director issues Findings & Orders to S.H. Bell to reduce air pollutant emissions and petitions ATSDR to evaluate potential health effects of airborne metals in East Liverpool OH.
- Delayed and modified R5 RARE proposal for health study of airborne Mn in Marietta adults is recommended to R5 management for 2009 funding

- 2008 Standridge et al. (Erin Haynes group, U of Cincinnati) publish pilot study of Marietta adults, concluding "...Preliminary findings suggest subclinical impairment in postural balance among residents chronically exposed to ambient Mn."
- 2009 ATSDR Marietta OH Health Consultation released, concluding that Mn is the only identified metal exceeding both background concentrations and health based guidelines.
- EPA-funded Mn health study ("RARE Pt. 1") initiated in Marietta and Mt. Vernon OH, which ATSDR supports.
- EPA releases list of schools for air monitoring as part of initiative to understand whether outdoor toxic air pollution poses health concerns to school children (School Air Toxics study). Two Marietta schools and one East Liverpool school are listed.
- 2010 Preliminary RARE Pt. 1 results released at a public meeting in Marietta OH, reporting few Marietta-Mt. Vernon differences; e.g. those living closer to the source scored worse on some neuropsychological tests but most results are within normal ranges.
- ATSDR issues Health Consultation for East Liverpool Air Quality Investigation. It concludes that Mn is the only chemical exceeding both background levels and health-based guidelines and poses a public health hazard (Water Plant Monitor 10 year TSP Mn average concentration = 1.3 ug/m³, HQ=26)
- 2011 RARE Part 2 "Epidemiologic Health Study of Manganese Exposure in East Liverpool OH" is selected and funded. East Liverpool field work (e.g. blood samples, neurologic exam, test batteries) conducted in November 2011.
- Kim, Bowler et al. paper published in Neurotoxicology (motor function; Marietta-Mt. Vernon, RARE Pt. 1 results) reports subclinical effects on movement and balance tests, but says that subtle effects and limited biologic plausibility reduce the likelihood that airborne Mn is the cause.
- 2012 Bowler et al. paper published in International Journal of Hygiene and Environmental Health (anxiety and motor effects; Marietta-Mt. Vernon, RARE Pt. 1 results). Town differences in anxiety are reported, but authors state that whether airborne Mn or heightened concern about air pollution is responsible "remains an open question".
- 2013 EPA contract finalized with San Francisco State University to continue Ohio Mn health study work. First contract deliverable is a 4/18/13 East Liverpool public meeting to present preliminary health study results to the community.
- Final EPA rule for Ferroalloys Production (affecting Eramet-Marietta) scheduled for promulgation